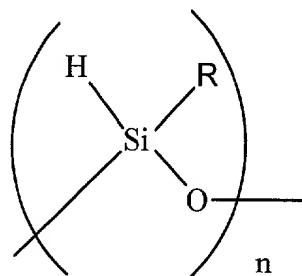


WHAT IS CLAIMED IS:

1 1. A method for improving the fray resistance of a suture comprising
2 at least one filament, the method comprising:
3 applying a coating to at least a portion of a surface of the at least
4 one filament of the suture by a plasma polymerization process of a
5 hydrocyclosiloxane monomer of the general formula



6
7 where R is an aliphatic group and n is an integer from 2 to about 10, preferably 4
8 to 6.

1 2. The method according to claim 1 wherein the hydrocyclosiloxane
2 monomer is selected from the group consisting of 1,3,5,7-
3 tetramethylcyclotetrasiloxane; 1,3,5,7,9-pentamethylhydrocyclopentasiloxane;
4 1,3,5,7,9,11-hexamethylhydrocyclohexasiloxane and a mixture of 1,3,5,7,9-
5 pentamethylcyclopentasiloxane and 1,3,5,6,9,11-hexamethylcyclohexasiloxane
6 monomers.

1 3. The method according to claim 1 wherein the coating further
2 comprises an amine group that has been introduced onto the coating by plasma

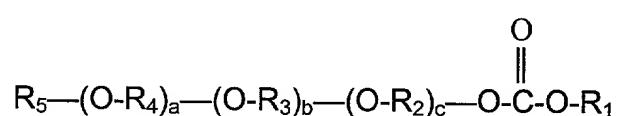
3 polymerization of a gas containing a monomer selected from the group consisting
4 essentially of unsaturated N-protected amines, unsaturated N-unprotected
5 amines, N-protected cyclic aliphatic amines, and N-unprotected cyclic aliphatic
6 amines, to produce an amine grafted polymer coating.

1 4. The method according to claim 3 wherein the unsaturated or
2 cyclic amine is copolymerized with the hydrocyclosiloxane monomer onto the
3 surface of the at least one filament of the suture.

1 5. The method according to claim 3 wherein the unsaturated or
2 cyclic amine is plasma grafted onto the coating on the surface of the at least one
3 filament of the suture.

1 6. The method according to claim 3 wherein said unsaturated or
2 cyclic amine is N-trimethylsilylallylamine.

1 7. The method according to claim 3 wherein a carbonate-based
2 polyalkylene oxide compound is contacted with the amine grafted polymer
3 coating to produce a polyoxyalkylene modified polymer coating, the carbonate-
4 based polyalkylene oxide compound comprising the general formula

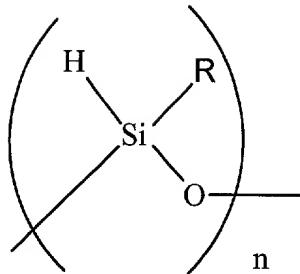


8 wherein R₁ is selected from an N-benzotriazole group, an N-2-pyrrolidinone
9 group, or a 2-oxypyrimidine group; R₂, R₃ and R₄ are independently selected
10 alkylene groups of about 2 to about 3 carbon atoms and may be the same or
11 different; R₅ is selected from hydrogen, methyl, a carboxyloxy-N-benzotriazole
12 group, a carboxyloxy-N-2-pyrrolidinone group, and a carbonyl-2-oxypyrimidine
13 group; a is an integer from 1 to 1000 and each of b and c is an integer from 0 to
14 1000, where a+b+c is an integer from 3 to 1000.

1 8. The method according to claim 7 wherein said carbonate-based
2 polyalkylene oxide compound is polyoxyethylene bis-(N-hydroxybenzotriazolyl)
3 carbonate.

1 9. The method of claim 1 wherein the suture comprises at least one
2 polypropylene fiber.

1 10. A method for making a coated suture comprising :
2 providing a suture comprising at least one filament having a
3 surface; and
4 applying a coating to at least a portion of the surface of the at least
5 one filament of the suture by a plasma polymerization process of a
6 hydrocyclosiloxane monomer of the general formula



7

8 where R is an aliphatic group and n is an integer from 2 to about 10, preferably 4
9 to 6.

1 11. The method according to claim 10 wherein the hydrocyclosiloxane
2 monomer is selected from the group consisting of 1,3,5,7-
3 tetramethylcyclotetrasiloxane; 1,3,5,7,9-pentamethylhydrocyclopentasiloxane;
4 1,3,5,7,9,11-hexamethylhydrocyclohexasiloxane and a mixture of 1,3,5,7,9-
5 pentamethylcyclopentasiloxane and 1,3,5,6,9,11-hexamethylcyclohexasiloxane
6 monomers.

1 12. The method according to claim 10 wherein the coating further
2 comprises an amine group that has been introduced onto the coating by plasma
3 polymerization of a gas containing a monomer selected from the group consisting
4 essentially of unsaturated N-protected amines, unsaturated N-unprotected
5 amines, N-protected cyclic aliphatic amines, and N-unprotected cyclic aliphatic
6 amines, to produce an amine grafted polymer coating.

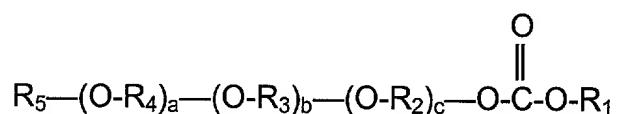
1 13. The method according to claim 12 wherein the unsaturated or

2 cyclic amine is copolymerized with the hydrocyclosiloxane monomer onto the
3 surface of the at least one filament of the suture.

1 14. The method according to claim 12 wherein the unsaturated or
2 cyclic amine is plasma grafted onto the coating on the surface of the at least one
3 filament of the suture.

1 15. The method according to claim 12 wherein said unsaturated or
2 cyclic amine is N-trimethylsilylallylamine.

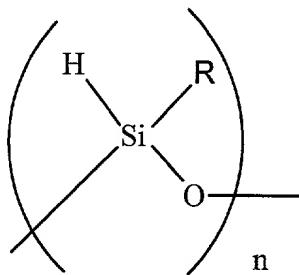
1 16. The method according to claim 12 wherein a carbonate-based
2 polyalkylene oxide compound is contacted with the amine grafted polymer
3 coating to produce a polyoxyalkylene modified polymer coating, the carbonate-
4 based polyalkylene oxide compound comprising the general formula



8 wherein R₁ is selected from an N-benzotriazole group, an N-2-pyrrolidinone
9 group, or a 2-oxypyrimidine group; R₂, R₃ and R₄ are independently selected
10 alkylene groups of about 2 to about 3 carbon atoms and may be the same or
11 different; R₅ is selected from hydrogen, methyl, a carboxyloxy-N-benzotriazole
12 group, a carboxyloxy-N-2-pyrrolidinone group, and a carbonyl-2-oxypyrimidine
13 group; a is an integer from 1 to 1000 and each of b and c is an integer from 0 to
14 1000, where a+b+c is an integer from 3 to 1000.

1 17. The method according to claim 16 wherein said carbonate-based
2 polyalkylene oxide compound is polyoxyethylene bis-(N-hydroxybenzotriazolyl)
3 carbonate.

1 18. A suture comprising:
2 at least one filament; and
3 a coating formed on at least a portion of a surface of the at least
4 one filament by a plasma polymerization process wherein a polymer coating is
5 formed on the filament surface from a hydrocyclosiloxane monomer of the
6 general formula



7
8 where R is an aliphatic group and n is an integer from 2 to about 10, preferably 4
9 to 6.

1 19. A suture according to claim 18 wherein the hydrocyclosiloxane
2 monomer is selected from the group consisting of 1,3,5,7-
3 tetramethylcyclotetrasiloxane; 1,3,5,7,9-pentamethylhydrocyclopentasiloxane;
4 1,3,5,7,9,11-hexamethylhydrocyclohexasiloxane and a mixture of 1,3,5,7,9-

5 pentamethylcyclopentasiloxane and 1,3,5,6,9,11-hexamethylcyclohexasiloxane
6 monomers.

1 20. A suture according to claim 18 wherein the at least one filament is
2 made from a synthetic, absorbable polymer composition.

1 21. A suture according to claim 18 wherein the at least one filament is
2 made from a synthetic, non-absorbable polymer composition.

1 22. A suture according to claim 21 wherein the synthetic, non-
2 absorbable polymer composition comprises one or more materials selected from
3 the group consisting of nylon and polypropylene.

1 23. A suture according to claim 20 wherein the synthetic, absorbable
2 polymer composition comprises a homopolymer or copolymer derived from one
3 or more monomers selected from the group consisting of glycolic acid, glycolide,
4 lactic acid, lactide, dioxanone, caprolactone, polycaprolactone, epsilon-
5 caprolactone, trimethylene carbonate.

1 24. The suture of claim 18 wherein the coating further comprises an
2 amine group that has been introduced onto the coating by plasma polymerization
3 of a gas containing a monomer selected from the group consisting essentially of
4 unsaturated N-protected amines, unsaturated N-unprotected amines, N-

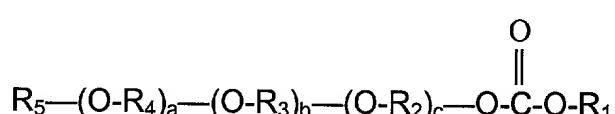
5 protected cyclic aliphatic amines, and N-unprotected cyclic aliphatic amines, to
6 produce an amine grafted polymer coating.

1 25. The suture of claim 24 wherein the unsaturated or
2 cyclic amine is copolymerized with the hydrocyclosiloxane monomer onto the
3 surface of the at least one filament of the suture.

1 26. The suture of claim 24 wherein the unsaturated or
2 cyclic amine is plasma grafted onto the coating on the surface of the at least one
3 filament of the suture.

1 27. The suture of claim 24 wherein said unsaturated or cyclic amine is
2 N-trimethylsilylallylamine.

1 28. The suture of claim 24 wherein a carbonate-based polyalkylene
2 oxide compound is contacted with the amine grafted polymer coating to produce
3 a polyoxyalkylene modified polymer coating, the carbonate-based polyalkylene
4 oxide compound comprising the general formula



8 wherein R₁ is selected from an N-benzotriazole group, an N-2-pyrrolidinone
9 group, or a 2-oxyprymidine group; R₂, R₃ and R₄ are independently selected
10 alkylene groups of about 2 to about 3 carbon atoms and may be the same or

11 different; R₅ is selected from hydrogen, methyl, a carbonyloxy-N-benzotriazole
12 group, a carbonyloxy-N-2-pyrrolidinone group, and a carbonyl-2-oxyimidine
13 group; a is an integer from 1 to 1000 and each of b and c is an integer from 0 to
14 1000, where a+b+c is an integer from 3 to 1000.

1 29. The suture of claim 28 wherein said carbonate-based polyalkylene
2 oxide compound is polyoxyethylene bis-(N-hydroxybenzotriazolyl) carbonate.